

CLAIMS

1. A substrate holding apparatus comprising:

5 a substrate holder, provided with a first sealing member,
for supporting a substrate by bringing a peripheral portion of
a surface to be processed of the substrate into contact with
the first sealing member; and

a substrate pressing section for lowering relative to the
substrate holder so as to press the substrate held by the substrate
10 holder downward, thereby bringing the first sealing member into
pressure contact with the substrate;

wherein the substrate pressing section is provided with
a second ring-shaped sealing member which, when the substrate
pressing section lowers relative to the substrate holder, makes
15 pressure contact with an upper surface of a ring-shaped holding
section of the substrate holder, thereby sealing the peripheral
region of the substrate pressing section.

2. The substrate holding apparatus according to claim 1,
20 wherein the second sealing member is comprised of an elastic
body.

3. The substrate holding apparatus according to claim 1,
wherein the second sealing member has a weir portion of a desired
25 height.

4. The substrate holding apparatus according to claim 1,
wherein the first sealing member is reinforced with a reinforcing
material embedded therein.

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5. The substrate holding apparatus according to claim 1,
wherein the substrate pressing section is provided with a
plurality of pressing pins, each pin being exposed at the lower
end and biased downwardly by an elastic body.

6. The substrate holding apparatus according to claim 1, wherein the substrate pressing section is provided with a flat cover plate having an air hole.

5 7. A substrate holding method comprising:

bringing a first ring-shaped sealing member, mounted to a substrate holder, into pressure contact with a peripheral portion of a substrate by a substrate processing section to seal the peripheral portion of the substrate; and at the same time,

10 bringing a second sealing member, mounted to the substrate pressing section, into pressure contact with the substrate holder to seal the peripheral region of the substrate pressing section, thereby holding the substrate.

15 8. The substrate holding method according to claim 7, wherein the second sealing member has a weir portion of a desired height.

9. A substrate processing apparatus comprising:

20 a substrate holding apparatus for holding a substrate;
and

a processing tank for bringing a surface to be processed of a substrate, held by the substrate holding apparatus, into contact with a processing liquid stored in the processing tank;

25 wherein the substrate holding apparatus comprises:

a substrate holder, provided with a first sealing member, for supporting the substrate by bringing the peripheral portion of the surface to be processed of the substrate into contact with the first sealing member; and

30 a substrate pressing section for lowering relative to the substrate holder so as to press the substrate held by the substrate holder downward, thereby bringing the first sealing member into pressure contact with the substrate;

wherein the substrate pressing section is provided with a second ring-shaped sealing member which, when the substrate pressing section lowers relative to the substrate holder, makes pressure contact with an upper surface of a ring-shaped holding section of the substrate holder, thereby sealing the peripheral region of the substrate pressing section.

10. The substrate processing apparatus according to claim 9, wherein the processing of the surface to be processed of the substrate with the processing liquid is a pre-plating processing.

11. A substrate holding apparatus comprising:
a substrate holding section for supporting a substrate with its front surface facing downward; and
an attraction head provided with an attraction seal for attracting and holding the substrate supported by the substrate holding section while sealing a peripheral portion of the back surface of the substrate in a ring;

wherein the substrate holding section is provided with a plurality of pressing mechanisms, disposed at locations along the circumferential direction of the substrate holding section, for contacting a peripheral portion of the front surface of the substrate supported by the substrate holding section and pressing the substrate against the attraction head.

12. The substrate holding apparatus according to claim 11, wherein each pressing mechanism includes a movable claw which, as the substrate holding section moves relatively and closer to the attraction head, comes into contact with a peripheral portion of the front surface of the substrate and presses the substrate against the attraction head.

13. The substrate holding apparatus according to claim 12, wherein the movable claw is supported vertically pivotably by a pivot shaft and disposed along the diametral direction of the substrate holding section, biased downwardly by an elastic
5 body on the outer side of the pivot shaft, and makes contact with a peripheral portion of the front surface of the substrate on the inner side of the pivot shaft.

14. The substrate holding apparatus according to claim
10 13, wherein the elastic body is comprised of a generally truncated conical rubber.

15. A substrate holding apparatus comprising:
a substrate holding section for supporting a substrate
15 with its front surface facing downward; and
an attraction head provided with an attraction seal for attracting and holding the substrate supported by the substrate holding section while sealing a peripheral portion of the back surface of the substrate in a ring;
20 wherein the substrate holding section includes:
a base section; and
a substrate support section for supporting the substrate, disposed at a given distance from the base section and tiltably coupled to the base section by a coupling section provided at
25 a peripheral portion of the substrate support section.

16. The substrate holding apparatus according to claim 15, wherein the coupling section includes an elastic body for elastically coupling a member on the base section side and a
30 member on the substrate support section side.

17. The substrate holding apparatus according to claim 16, wherein the elastic body is comprised of a helical spring.

18. A substrate holding method comprising:

5 supporting a substrate with its front surface facing downward;

pressing the substrate against a ring-shaped attraction seal portion by a plurality of pressing mechanisms disposed at locations along the circumferential direction of the substrate, thereby bringing a peripheral portion of the back surface of the substrate into tight contact with the attraction seal portion; and

vacuuming the attraction seal portion to hold the substrate.

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19. A substrate holding method comprising:

supporting a substrate with its front surface facing downward;

20 moving the substrate to a ring-shaped attraction seal portion while tilting the substrate, thereby bringing a peripheral portion of the back surface of the substrate into tight contact with the attraction seal portion; and

vacuuming the attraction seal portion to hold the substrate.

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20. A substrate processing apparatus comprising:

a substrate holding apparatus for holding a substrate; and

30 a processing tank for bringing a surface to be processed of a substrate, held by the substrate holding apparatus, into contact with a processing liquid stored in the processing tank;

wherein the substrate holding apparatus comprises:

a substrate holding section for supporting the substrate with its front surface facing downward; and

an attraction head provided with an attraction seal for attracting and holding the substrate supported by the substrate holding section while sealing the peripheral portion of the back surface of the substrate in a ring;

5 wherein the substrate holding section is provided with a plurality of pressing mechanisms, disposed at locations along the circumferential direction of the substrate holding section, for contacting a peripheral portion of the front surface of the substrate supported by the substrate holding section and pressing
10 the substrate against the attraction head.

21. The substrate processing apparatus according to claim 20, wherein the processing of the surface to be processed of the substrate with the processing liquid is electroless plating.
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22. A substrate processing apparatus comprising:
a substrate holding apparatus for holding a substrate;
and
a processing tank for bringing a surface to be processed
20 of a substrate, held by the substrate holding apparatus, into contact with a processing liquid stored in the processing tank:
wherein the substrate holding apparatus comprises:
a substrate holding section for supporting a substrate with its front surface facing downward; and
25 an attraction head provided with an attraction seal for attracting and holding the substrate supported by the substrate holding section while sealing a peripheral portion of the back surface of the substrate in a ring;
wherein the substrate holding section includes:
30 a base section; and
a substrate support section for supporting the substrate, disposed at a given distance from the base section and tiltably coupled to the base section by a coupling section provided at a peripheral portion of the substrate support section.

23. The substrate processing apparatus according to claim 22, wherein the processing of the surface to be processed of the substrate with the processing liquid is electroless plating.